What is claimed is:

1. A rotor for a positive displacement compressor comprising:

a non-rotating rotor shaft;

a rotatable rotor body having end surfaces and surrounding the rotor shaft; and

means for rotating the rotor body around the shaft.

2. The rotor according to claim 1, wherein the means for rotating the rotor body around the shaft comprises:

rotor magnets on the rotor body, wherein the magnets are arranged in a circle centered on an axis of the rotor body and facing the shaft; and

electrical stator leads provided on the shaft in registration with the rotor magnets.

3. The rotor according to claim 2, further comprising an electrical power source and leads connecting the power source to the stator leads.

4. The rotor according to claim 1, further comprising magnetic induction bearings between the shaft and the rotor body.

5. The rotor according to claim 2, wherein the rotor magnets are arranged between the end surfaces of the rotor body.

6. The rotor according to claim 1, wherein an outer surface of the rotor body comprises lobes and intermediate grooves.

7. The rotor according to claim 6, wherein the lobes and grooves extend helically along the rotor body.

8. A positive displacement compressor comprising:

(i) a housing comprising:

a first end wall and a second end wall,

a barrel wall having an inner shape substantially corresponding to two intersecting cylinders between the end walls,

an inlet port for fluid, and

an outlet port for fluid;

(ii) a male rotor mounted in the housing and comprising:

a non-rotatable male rotor shaft protruding into the end walls, and

a rotatable male rotor body surrounding the rotor shaft and extending between the end walls, wherein the male rotor body comprises first lobes and first intermediate grooves on an outer surface of the male rotor body;

(iii) a female rotor cooperating with the male rotor and mounted in the housing parallel to the male rotor, the female rotor comprising:

a non-rotatable female rotor shaft protruding into the end walls, and

a rotatable female rotor body surrounding the rotor shaft and extending between the end walls, wherein the female rotor body comprises second lobes and second intermediate grooves on an outer surface of the female rotor body;

(iv) means for rotating the male rotor body around the male shaft;

(v) means for rotating the female rotor body around the female rotor shaft; and

(vi) bearings provided between the male rotor shaft and the male rotor body and between the female rotor shaft and the female rotor body.

9. The compressor according to claim 8,

wherein the means for rotating the male rotor body around the male rotor shaft comprises:

rotor magnets in the male rotor body, wherein the magnets are arranged in a circle centered on an axis of the rotor body and facing the shaft; and

electrical stator leads provided on the shaft in registration with the rotor magnets, wherein the electrical stator leads are connectable to a power source;

wherein the means for rotating the female rotor body around the female rotor shaft comprises:

rotor magnets in the female rotor body, wherein the magnets are arranged in a circle centered on the axis of the rotor body and facing the shaft; and

electrical stator leads provided on the shaft in registration with the rotor magnets, wherein the electrical stator leads are connectable to a power source.

10. The compressor according to claim 8, wherein the bearings are roller bearings.

11. The compressor according to claim 9, wherein the bearings are roller bearings.

12. The compressor according to claim 8, wherein the bearings are ball bearings.

13. The compressor according to claim 9, wherein the bearings are ball bearings.

14. The compressor according to claim 8, wherein at least one bearing is a radial induction bearing.

15. The compressor according to claim 9, wherein at least one bearing is a radial induction bearing.

16. The compressor according to claim 8, wherein the lobes and grooves extend helically along the rotor bodies.

17. The compressor according to claim 9, wherein the lobes and grooves extend helically along the rotor bodies.

18. The compressor according to claim 16, wherein the bearings are roller bearings.

19. The compressor according to claim 17, wherein the bearings are roller bearings.

20. The compressor according to claim 16, wherein the bearings are ball bearings.

21. The compressor according to claim 17, wherein the bearings are ball bearings.

22. The compressor according to claim 16, wherein at least one bearing is a radial induction bearing.

23. The compressor according to claim 17, wherein at least one bearing is a radial induction bearing.